

ABSTRACT OF THE DISCLOSURE

A thermoforming apparatus having a mold with an internal vacuum chamber and a quench for cooling a thermoplastic sheet while it remains on the mold. Because the quench cools the sheet, conventional cooling lines are eliminated from the mold. A preferred process of using the thermoforming apparatus includes drawing a heated sheet over the mold, creating a partial vacuum in the vacuum chamber of the mold to maintain the sheet on the mold and quenching the sheet on the mold in a quenching tank. A preferred process of manufacturing a mold with an interior vacuum chamber includes forming an impression of the mold in a casting media, suspending a vacuum line or vacuum cabinet within the impression and pouring molten material around the vacuum line or vacuum cabinet to form the mold at least partially surrounding the vacuum line or vacuum cabinet. Vacuum holes are drilled through the mold from the mold face to the vacuum chamber.

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